APPLYING TERM CONSISTENCY TO AN EQUALITY CONSTRAINED INTERVAL GLOBAL OPTIMIZATION PROBLEM

ABSTRACT

One embodiment of the present invention provides a system that solves a global optimization problem specified by a function f and a set of equality constraints $q_i(\mathbf{x}) = 0$ $(i=1,...,r)$, wherein f is a scalar function of a vector $\mathbf{x} = (x_1, x_2, x_3, \ldots x_n)$. During operation, the system receives a representation of the function f and the set of equality constraints and stores the representation in a memory within a computer system. Next, the system and performs an interval global optimization process to compute guaranteed bounds on a globally minimum value of the function $f(\mathbf{x})$ subject to the set of equality constraints. Performing this interval global optimization process involves, applying term consistency to the set of equality constraints over a subbox $\mathbf{X}$, and excluding portions of the subbox $\mathbf{X}$ that violate the set of equality constraints.